

CLAIMS

1. A retroreflective sheeting with triangular pyramidal frustum prism elements, which comprises a reflective element layer containing the triangular pyramidal frustum prism elements in a close-packed state formed on one surface thereof, and satisfies the following requirements:

the triangular pyramidal frustum prism element has a bottom surface with one side length thereof being in the range of 50 to 400 μm , and a difference between a longest side and a shortest side thereof being 200 μm or less;

the length of a longest edge of the triangular pyramidal frustum prism element is in the range of 30 to 400 μm , and a difference between the longest edge and a shortest edge among the three edges is 100 μm or less;

when a vertical line which intersects perpendicularly with the bottom surface is drawn from a top surface of the triangular pyramidal frustum prism element to the bottom surface thereof, the length of a longest vertical line is in the range of 20 to 250 μm ; and

an angle between adjacent side surfaces of the triangular pyramidal frustum prism element is in the range of 85 to 95 degrees.

2. A retroreflective sheeting according to claim 1,

wherein

the lengths of the three sides of the bottom surface of the triangular pyramidal frustum prism element are different one from another.

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3. A retroreflective sheeting according to claim 1 or claim 2, wherein

the area ratio of the top surface of the triangular pyramidal frustum prism element to the bottom surface thereof is in the range of 1/100 to 1/16.

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4. A retroreflective sheeting according to any one of claims 1 to 3, wherein

the reflective element layer is formed on a resin film having a thickness in the range of 30 to 300 μm , and a total light transmittance of 20% or more.

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5. A retroreflective sheeting according to any one of claims 1 to 4, wherein

the retroreflective sheeting has a backing film made of a resin,

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the backing film is locally attached to a film having the reflective element layer formed thereon via protruding supports provided by emboss processing in such a manner that an air is sealed between the reflective element layer and the

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backing film and that a plurality of airtight chambers are formed.

6. A retroreflective sheeting according to any one of claims 1 to 5, wherein

the backing film is placed adjacent on the top surfaces of the respective triangular pyramidal frustum prism elements without protruding supports.

7. A resin film for use in a retroreflective sheeting with triangular pyramidal frustum prism elements, which comprises a reflective element layer containing the triangular pyramidal frustum prism elements in a close-packed state formed on one surface thereof, wherein

the triangular pyramidal frustum prism element has a bottom surface in the shape of a triangle, with one side length thereof being in the range of 50 to 400 μm , and a difference between a longest side and a shortest side thereof being 200 μm or less;

the length of a longest edge of the triangular pyramidal frustum prism element is in the range of 30 to 400 μm ;

when a vertical line which intersects perpendicularly with the bottom surface is drawn from a top surface of the

triangular pyramidal frustum prism element to the bottom surface thereof, the length of a longest vertical line is in the range of 20 to 250 μm ; and

an angle between adjacent side surfaces of the triangular pyramidal frustum prism element is in the range of 85 to 95 degrees.

8. A resin film according to claim 7, wherein

the resin film is made of one or more kinds of resins selected from the group consisting of acrylic resin, polycarbonate resin, polystyrene resin, polyester resin, polyethylene resin, polypropylene resin, polyvinylchloride resin, polyarylate resin, polyurethane resin, epoxy resin, fluoro-resin, and cellulose resin, and

the resin film has a thickness in the range of 30 to 300 μm , and a total light transmittance of 20% or more, and is capable of forming the reflective element layer thereon.

9. A resin film according to claim 7 or 8, wherein

the resin film contains a UV absorber selected from benzotriazols, benzophenones, triazines or the like, a light stabilizer selected from hindered amines or the like, an antioxidant including phenols, phosphates, or the like, or a lubricant such as montanic esters or metal stearate salts.

10. A resin film according to any one of claims 7 to 9, wherein

the resin film contains an organic dye such as
5 thioxanthenes, coumarins, perylenes, methines, benzopyrans,
thioindigos, or anthraquinones, or an organic pigment such as
azo pigments or phthalocyanines.